

CLAIMS

1. A composite membrane comprising a first membrane comprising N-acetylated chitosan deposited on a porous substrate.
2. The composite membrane as claimed in claim 1, wherein the N-acetylated chitosan is characterized by a degree of N-acetylation greater than 50%.
3. The composite membrane as claimed in claim 1, wherein the N-acetylated chitosan is characterized by a degree of N-acetylation within the range of from about 50% to about 90%.
4. The composite membrane as claimed in claim 1, wherein the porous substrate includes a porous substrate membrane, and wherein the first membrane is deposited upon the porous substrate membrane.
5. The composite membrane as claimed in claim 4, wherein the porous substrate membrane includes at least one of polyetherimide, polyvinylidene fluoride, polysulfone, polyether sulfone, polyacrylonitrile and a ceramic.
6. The composite membrane as claimed in claim 1, wherein the porous substrate includes a porous substrate membrane deposited on a polyester non-woven fabric.
7. A composite membrane comprising chitin deposited on a porous substrate membrane.
8. A composite membrane comprising:
 - a first layer including N-acetylated chitosan; and
 - a second layer including a porous substrate membrane;

wherein the first layer is deposited upon the second layer.

9. The membrane as claimed in claim 8, wherein the N-acetylated chitosan is characterized by a degree of N-acetylation greater than 50%.

10. The membrane as claimed in claim 8, wherein the N-acetylated chitosan is characterized by a degree of N-acetylation within the range of from about 50% to about 90%.

11. A composite membrane comprising:

a first layer including chitin; and

a second layer including a porous substrate membrane;

wherein the first layer is deposited upon the second layer.

12. A method of forming a composite membrane comprising the steps of:

(i) forming a porous substrate membrane;

(ii) depositing chitosan solution on the porous substrate membrane to form a first intermediate;

(iii) drying the first intermediate to form an intermediate composite membrane including a chitosan membrane; and

(iv) converting the chitosan membrane to a chitin membrane.

13. The method as claimed in claim 10, wherein the chitosan membrane is converted to a chitin membrane by acetylation.

14. The method as claimed in claim 13, wherein the intermediate composite membrane is immersed in a solution comprising acetyl radicals or acetyl groups for acetylating the chitosan membrane.

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15. The method as claimed in claim 14, wherein the solution comprises acetic anhydride or acetyl chloride.

16. The method as claimed in claim 13, wherein the intermediate composite membrane is immersed in a solution comprising no more than 7 mol. acetic anhydride per glucosamine.

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17. A method for separating a liquid mixture including a polar liquid and a non-polar liquid, comprising the steps of:

providing a composite membrane comprising a first layer including N-acetylated chitosan, and a second layer including a porous substrate membrane, wherein the first layer is deposited upon the second layer; and

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contacting the mixture with the first layer of the composite membrane.

18. The method as claimed in claim 17, wherein the non-polar liquid is an organic liquid.

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19. The method as claimed in claim 18, wherein the liquid is aromatic.

20. The method as claimed in claim 19, wherein the polar liquid is an alcohol.

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21. A composite membrane comprising a first membrane including N-acetylated chitosan, and a porous substrate, wherein the first membrane is physically adhered to the porous substrate.